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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,434	09/28/2006	Manfred T. Reetz	100716-66 KGB	8789
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Briscoe, Kurt G. Norris McLaughlin & Marcus, PA 875 Third Avenue, 8th Floor New York, NY 10022			EXAMINER EMPIE, NATHAN H	
			ART UNIT	PAPER NUMBER
			1792	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/599,434	<b>Applicant(s)</b> REETZ ET AL.	
	<b>Examiner</b> NATHAN H. EMPIE	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,3-8 and 10-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-8 and 10-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/28/06, 3/31/09</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

Examiner acknowledges receipt of 11/4/09 amendment to the claims which was entered into the file. Claims 1, 3-8, and 10-18 are currently pending. In view of the claim amendments of 11/4/09, the examiner retracts the previous restriction requirement.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 13 is dependant upon claim 12, which requires "the Ir salt is selected from the group consisting of alkali metal-iridium salts", yet the Markush group presented in claim 13 contains Ir salts that are not "alkali metal-iridium salts", for example,  $\text{IrCl}_3 \cdot \text{H}_2\text{O}$ ,  $\text{IrCl}_4 \cdot \text{H}_2\text{O}$ , and  $\text{H}_2\text{IrCl}_6 \cdot \text{H}_2\text{O}$ . As the applicant's specification explicitly teaches the entire Markush grouping of claim 13, but doesn't specifically describe all of these salts as alkali metal salts, it is believed that all of the species are desired to be claimed. So to retain the entirety of the Markush group, and for purposes of examination, the examiner will interpret claim 13 as being dependant on claim 5 (from which claim 12 depends) and not claim 12 directly.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3- 8, 10-11 and 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beer (US patent 3,711,385; as provided in Applicant's IDS of 9/28/06, hereafter Beer) in view of Ioroi et al ("Iridium Oxide / Platinum Electrocatalysts for Unitized Regenerative Polymer Electrolyte Fuel Cells" J. Electrochem. Soc. 147 (6) (2000) pg 2018-2022; hereafter Ioroi) and, optionally, further in view of Bestaoui et al ("A Chimie Douce Route to Pure Iridium Oxide" Chem. Mater. 1997 9. pg 1036-1041; hereafter Bestaoui).

Claim 18: Beer teaches a process comprising preparing colloidal iridium oxide (see, for example, abstract, col 2 lines 20 – 42, and col 11 lines 50 – 65) by a process comprising;

forming an aqueous solution of an Ir salt and admixing with a Bronsted base (NaOH) to produce a mixture, and coating a colloidal iridium oxide, and other platinum group oxides onto a surface (see, for example, col 2 lines 20 – 42, col 7 lines 25 – 42, and col 11 lines 50 – 65). Beer is silent as to the specific reaction conditions, so Beer does not explicitly teach adjusting the pH to >12 or stirring the mixture at a temperature from 0 to 100°C over a period of from 3 to 72 hours. Ioroi teaches a method of forming iridium oxide from the reactants comprising an iridium salt, water, and NaOH (see, for

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example, abstract, and pg 2018-2020). Ioroi teaches that the iridium oxide can predictably be synthesized by stirring the reactants at a temperature of 40°C for several hours (see, for example, pg 2018). As both Beer and Ioroi teach methods for forming colloidal iridium oxide from precursors comprising, an iridium salt, water, and NaOH, it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated the reaction conditions taught by Ioroi into Beer in order to achieve the predictable result of forming iridium oxide and when a primary reference is silent as to a certain detail, one of ordinary skill would be motivated to consult a secondary reference which satisfies the deficiencies of the primary reference. Although Beer in view of Ioroi doesn't explicitly teach holding at temperature of from 3 to 72 hours, the examiner asserts that a teaching of "several hours" at the very least would overlap this claimed range, so it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated a period within the claimed range since in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Ioroi further teaches that the pH of the solution is lowered to ~8 following the continuous stirring (see, for example, pg 2018), so the pH of this solution was therefore higher than 8 during mixing / stirring. Although a pH of greater than 8 is not explicitly > 12, it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated a pH within the claimed range since in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

Claim 18 (optionally further in view of Bestaoui) - Beer in view of Ioroi teaches a pH of greater than 8, but they are silent as to what the pH was originally adjusted to, so neither Beer nor Ioroi explicitly teach that the pH is adjusted to  $>12$ . Bestaoui teaches a method of forming colloidal iridium oxide from the reactants comprising an iridium salt, water, and an alkali metal hydroxide (see, for example, abstract, and pg 1037-1040). Bestaoui further teaches wherein the pH of the salt / water / hydroxide solution is adjusted to about 12 (see, for example, pg 1039). And Bestaoui further teaches that pH is a result effective variable influencing the rate of hydrolysis (see, for example, pg 1037 - 1039, and Fig 2 and 3). As Bestaoui and Beer in view of Ioroi teach methods for forming colloidal iridium oxide from precursors comprising, an iridium salt, water, and alkali metal hydroxides, it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated the reaction conditions taught by Bestaoui in to the method of Beer in view of Ioroi in order to achieve the predictable result of forming iridium oxide and when a primary reference is silent as to a certain detail, one of ordinary skill would be motivated to consult a secondary reference which satisfies the deficiencies of the primary reference. Further, although the adjustment of the pH to about 12 is not explicitly  $>12$ , it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated a pH  $> 12$  since about 12 would include slightly lower or higher than 12 and these overlap the range of  $>12$ . In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

Claim 1: Beer in view of Ioroi (and Bestaoui, optionally) teaches the method of claim 18 (described above) wherein Beer further teaches applying colloidal platinum group oxides (such as iridium oxide) to a surface to yield a coated surface (see, for example, col 2 lines 20 - 43, col 3 line 66 – col 4 line 17, col 7 lines 25 - 65, and col 11 lines 50 - 75). Beer further teaches drying the coated surface and firing the coated surface at a temperature of at least 460°C (see, for example, col 7 lines 25 - 35). Although a temperature of at least 460°C is not explicitly the claimed range of 300 to 1000°C, it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated a temperature within this range since in the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). With respect to the remaining limitation of repeating the coating operation until a desired thickness is achieved this limitation is recited as optional, so it is not required to be taught by the prior art. Further the examiner takes official notice that repeating a coating operation (including heating steps) is well known in the art as a predictable way to build up and better control the coating thickness applied.

Claims 3 and 10: Beer in view of Ioroi (and Bestaoui, optionally) teaches the method of claim 18 (described above) wherein Beer has further taught NaOH as the Bronsted base.

Claim 4: Beer in view of Ioroi (and Bestaoui, optionally) teaches the method of claim 18 (described above, including the pH limitation) wherein Beer has further taught an aqueous solution of Ir salt is used (see, for example, col 11 lines 54 – 56).

Claim 5 and 13: Beer in view of Ioroi (and Bestaoui, optionally) teach the method of claim 18 (described above) wherein Ioroi has taught  $\text{H}_2\text{IrCl}_{6-x}\text{H}_2\text{O}$  as the Ir salt. Page 2018.

Claims 6, 7, and 14: Beer in view of Ioroi (and Bestaoui, optionally) teach the method of claim 18 (described above) wherein Beer further teaches the surface being coated is a Ti electrode (See, for example, col 3 lines 1 – 19).

Claims 8 and 16: Beer in view of Ioroi (and Bestaoui, optionally) teach the method of claim 18 (described above) wherein Beer further teaches that the electric conductivity of the platinum group oxides of relatively thin layers has been found to be virtually equal to that of the corresponding metals, while providing superior chemical resistance (see, for example, col 2 lines 13 - 20). So achieving thin layers is desirable to the method of Beer. Beer is silent as to the particle size produced, so Beer in view of Ioroi (and Bestaoui, optionally) do not explicitly teach wherein the colloidal iridium oxide produced has a particle size of less than or equal to 10nm or further less than or equal to 3nm, but the examiner asserts that such claimed particle sizes would be inherent to the process taught by Beer in view of Ioroi (and Bestaoui, optionally) since the prior art have taught a method comprising the same starting materials (such as water,  $\text{H}_2\text{IrCl}_{6-x}\text{H}_2\text{O}$ , and NaOH), and overlapping pH's and temperatures as the claimed method. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of obviousness has been established, In re Best, 195 USPQ 430, 433 (CCPA 1977). Further "When the PTO shows a sound basis for



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believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not” In re Spada, 15 USPQ2d 1655 1658 (Fed Cir. 1990). Here the sound basis for believing that the products of the applicant and the prior art are the same is the provision of the same claimed materials and process steps. Alternatively, as the particle size produced influences the level to which the layer thickness can be reduced, the particle size is a result effective variable, so it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated a particle size with the claimed ranges since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Claims 11 and 17: Beer in view of Ioroi teach the method of claims 4 and 18 (described above) wherein the combination of references have taught a pH greater than 8, (as described above in rejection of claim 18), but not explicitly greater than or equal to 13, it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated a pH > 13 or greater than or equal to 13 since in the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

Claim 15: Beer in view of Ioroi (and Bestaoui, optionally) teach the method of claim 18 (described above) wherein Beer further teaches the Ti electrode is an

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electrode for the evolution of oxygen and chlorine (see, for example, abstract, col 1 lines 30 – 39), and col 3 lines 11 - 19).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beer in view of Ioroi and Bestaoui.

Claim 12: Beer in view of Ioroi and Bestaoui teach the method of claim 18 (described above) wherein Bestaoui teaches alkali metal-iridium salts such as  $\text{Na}_2\text{IrCl}_2$  (see, for example, pg 1037).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHAN H. EMPIE whose telephone number is (571)270-1886. The examiner can normally be reached on M-F, 7:00- 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on (571) 272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. H. E./  
Examiner, Art Unit 1792

/Katherine A. Bareford/  
Primary Examiner, Art Unit 1792